

## SEQUENCE LISTING

## (1) GENERAL INFORMATION:

(i) APPLICANT: Presta, Leonard G.  
Jardieu, Paula M.

(ii) TITLE OF INVENTION: Antibody Mutants

(iii) NUMBER OF SEQUENCES: 17

(iv) CORRESPONDENCE ADDRESS:

(A) ADDRESSEE: Genentech, Inc.  
(B) STREET: 1 DNA Way  
(C) CITY: South San Francisco  
(D) STATE: California  
(E) COUNTRY: USA  
(F) ZIP: 94080

(v) COMPUTER READABLE FORM:

(A) MEDIUM TYPE: 3.5 inch, 1.44 Mb floppy disk  
(B) COMPUTER: IBM PC compatible  
(C) OPERATING SYSTEM: PC-DOS/MS-DOS  
(D) SOFTWARE: WinPatin (Genentech)

(vi) CURRENT APPLICATION DATA:

(A) APPLICATION NUMBER:  
(B) FILING DATE:  
(C) CLASSIFICATION:

(vii) PRIOR APPLICATION DATA:

(A) APPLICATION NUMBER: 60/031,945  
(B) FILING DATE: 11/27/96

(viii) ATTORNEY/AGENT INFORMATION:

(A) NAME: Lee, Wendy M.  
(B) REGISTRATION NUMBER: 40,378  
(C) REFERENCE/DOCKET NUMBER: P1064R1

(ix) TELECOMMUNICATION INFORMATION:

(A) TELEPHONE: 650/225-1994  
(B) TELEFAX: 650/952-9881

(2) INFORMATION FOR SEQ ID NO:1:

(i) SEQUENCE CHARACTERISTICS:

(A) LENGTH: 108 amino acids  
(B) TYPE: Amino Acid  
(D) TOPOLOGY: Linear

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:1:

Asp Val Gln Ile Thr Gln Ser Pro Ser Tyr Leu Ala Ala Ser Pro  
1 5 10 15

Gly Glu Thr Ile Ser Ile Asn Cys Arg Ala Ser Lys Thr Ile Ser  
20 25 30

Lys Tyr Leu Ala Trp Tyr Gln Glu Lys Pro Gly Lys Thr Asn Lys  
35 40 45

Leu Leu Ile Tyr Ser Gly Ser Thr Leu Gln Ser Gly Ile Pro Ser  
50 55 60

Arg Phe Ser Gly Ser Gly Ser Gly Thr Asp Phe Thr Leu Thr Ile  
65 70 75

Ser Ser Leu Glu Pro Glu Asp Phe Ala Met Tyr Tyr Cys Gln Gln  
80 85 90

His Asn Glu Tyr Pro Leu Thr Phe Gly Thr Gly Thr Lys Leu Glu  
95 100 105

Leu Lys Arg  
108

(2) INFORMATION FOR SEQ ID NO:2:

- (i) SEQUENCE CHARACTERISTICS:  
(A) LENGTH: 108 amino acids  
(B) TYPE: Amino Acid  
(D) TOPOLOGY: Linear

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:2:

Asp Ile Gln Met Thr Gln Ser Pro Ser Ser Leu Ser Ala Ser Val  
1 5 10 15

Gly Asp Arg Val Thr Ile Thr Cys Arg Ala Ser Lys Thr Ile Ser  
20 25 30

Lys Tyr Leu Ala Trp Tyr Gln Gln Lys Pro Gly Lys Ala Pro Lys  
35 40 45

Leu Leu Ile Tyr Ser Gly Ser Thr Leu Gln Ser Gly Val Pro Ser  
50 55 60

Arg Phe Ser Gly Ser Gly Ser Gly Thr Asp Phe Thr Leu Thr Ile  
65 70 75

Ser Ser Leu Gln Pro Glu Asp Phe Ala Thr Tyr Tyr Cys Gln Gln  
80 85 90

His Asn Glu Tyr Pro Leu Thr Phe Gly Gln Gly Thr Lys Val Glu  
95 100 105

Ile Lys Arg  
108

(2) INFORMATION FOR SEQ ID NO:3:

- (i) SEQUENCE CHARACTERISTICS:  
(A) LENGTH: 108 amino acids  
(B) TYPE: Amino Acid  
(D) TOPOLOGY: Linear

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:3:

Asp Ile Gln Met Thr Gln Ser Pro Ser Ser Leu Ser Ala Ser Val  
1 5 10 15

Gly Asp Arg Val Thr Ile Thr Cys Arg Ala Ser Gln Ser Ile Ser  
 20 25 30  
 Asn Tyr Leu Ala Trp Tyr Gln Gln Lys Pro Gly Lys Ala Pro Lys  
 35 40 45  
 5 Leu Leu Ile Tyr Ala Ala Ser Ser Leu Glu Ser Gly Val Pro Ser  
 50 55 60  
 10 Arg Phe Ser Gly Ser Gly Ser Gly Thr Asp Phe Thr Leu Thr Ile  
 65 70 75  
 Ser Ser Leu Gln Pro Glu Asp Phe Ala Thr Tyr Tyr Cys Gln Gln  
 80 85 90  
 15 Tyr Asn Ser Leu Pro Trp Thr Phe Gly Gln Gly Thr Lys Val Glu  
 95 100 105  
 Ile Lys Arg  
 108

## (2) INFORMATION FOR SEQ ID NO:4:

(i) SEQUENCE CHARACTERISTICS:  
 (A) LENGTH: 121 amino acids  
 (B) TYPE: Amino Acid  
 (D) TOPOLOGY: Linear

## (xi) SEQUENCE DESCRIPTION: SEQ ID NO:4:

30 Glu Val Gln Leu Gln Gln Pro Gly Ala Glu Leu Met Arg Pro Gly  
 1 5 10 15  
 Ala Ser Val Lys Leu Ser Cys Lys Ala Ser Gly Tyr Ser Phe Thr  
 20 25 30  
 35 Gly His Trp Met Asn Trp Val Arg Gln Arg Pro Gly Gln Gly Leu  
 35 40 45  
 40 Glu Trp Ile Gly Met Ile His Pro Ser Asp Ser Glu Thr Arg Leu  
 50 55 60  
 Asn Gln Lys Phe Lys Asp Lys Ala Thr Leu Thr Val Asp Lys Ser  
 65 70 75  
 45 Ser Ser Ser Ala Tyr Met Gln Leu Ser Ser Pro Thr Ser Glu Asp  
 80 85 90  
 Ser Ala Val Tyr Tyr Cys Ala Arg Gly Ile Tyr Phe Tyr Gly Thr  
 95 100 105  
 50 Thr Tyr Phe Asp Tyr Trp Gly Gln Gly Thr Thr Leu Thr Val Ser  
 110 115 120  
 Ser  
 121  
 55

## (2) INFORMATION FOR SEQ ID NO:5:

- (i) SEQUENCE CHARACTERISTICS:  
 (A) LENGTH: 121 amino acids  
 (B) TYPE: Amino Acid  
 (D) TOPOLOGY: Linear

5 (xi) SEQUENCE DESCRIPTION: SEQ ID NO:5:

|    |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |  |
|----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|--|
|    | Glu | Val | Gln | Leu | Val | Glu | Ser | Gly | Gly | Gly | Leu | Val | Gln | Pro | Gly |  |
|    | 1   |     |     |     | 5   |     |     |     |     | 10  |     |     |     |     | 15  |  |
| 10 | Gly | Ser | Leu | Arg | Leu | Ser | Cys | Ala | Ala | Ser | Gly | Tyr | Ser | Phe | Thr |  |
|    |     |     |     |     | 20  |     |     |     |     | 25  |     |     |     |     | 30  |  |
|    | Gly | His | Trp | Met | Asn | Trp | Val | Arg | Gln | Ala | Pro | Gly | Lys | Gly | Leu |  |
| 15 |     |     |     |     | 35  |     |     |     |     | 40  |     |     |     |     | 45  |  |
|    | Glu | Trp | Val | Gly | Met | Ile | His | Pro | Ser | Asp | Ser | Glu | Thr | Arg | Tyr |  |
|    |     |     |     |     | 50  |     |     |     |     | 55  |     |     |     |     | 60  |  |
| 20 | Asn | Gln | Lys | Phe | Lys | Asp | Arg | Phe | Thr | Ile | Ser | Val | Asp | Lys | Ser |  |
|    |     |     |     |     | 65  |     |     |     |     | 70  |     |     |     |     | 75  |  |
|    | Lys | Asn | Thr | Leu | Tyr | Leu | Gln | Met | Asn | Ser | Leu | Arg | Ala | Glu | Asp |  |
|    |     |     |     |     | 80  |     |     |     |     | 85  |     |     |     |     | 90  |  |
| 25 | Thr | Ala | Val | Tyr | Tyr | Cys | Ala | Arg | Gly | Ile | Tyr | Phe | Tyr | Gly | Thr |  |
|    |     |     |     |     | 95  |     |     |     |     | 100 |     |     |     |     | 105 |  |
|    | Thr | Tyr | Phe | Asp | Tyr | Trp | Gly | Gln | Gly | Thr | Leu | Val | Thr | Val | Ser |  |
| 30 |     |     |     |     | 110 |     |     |     |     | 115 |     |     |     |     | 120 |  |
|    | Ser |     |     |     |     |     |     |     |     |     |     |     |     |     |     |  |
|    | 121 |     |     |     |     |     |     |     |     |     |     |     |     |     |     |  |

35 (2) INFORMATION FOR SEQ ID NO:6:

- (i) SEQUENCE CHARACTERISTICS:  
 (A) LENGTH: 113 amino acids  
 (B) TYPE: Amino Acid  
 (D) TOPOLOGY: Linear

40 (xi) SEQUENCE DESCRIPTION: SEQ ID NO:6:

|    |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |  |
|----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|--|
|    | Glu | Val | Gln | Leu | Val | Glu | Ser | Gly | Gly | Gly | Leu | Val | Gln | Pro | Gly |  |
|    | 1   |     |     |     | 5   |     |     |     |     | 10  |     |     |     |     | 15  |  |
| 45 | Gly | Ser | Leu | Arg | Leu | Ser | Cys | Ala | Ala | Ser | Gly | Phe | Thr | Phe | Ser |  |
|    |     |     |     |     | 20  |     |     |     |     | 25  |     |     |     |     | 30  |  |
|    | Ser | Tyr | Ala | Met | Ser | Trp | Val | Arg | Gln | Ala | Pro | Gly | Lys | Gly | Leu |  |
| 50 |     |     |     |     | 35  |     |     |     |     | 40  |     |     |     |     | 45  |  |
|    | Glu | Trp | Val | Ser | Val | Ile | Ser | Gly | Asp | Gly | Gly | Ser | Thr | Tyr | Tyr |  |
|    |     |     |     |     | 50  |     |     |     |     | 55  |     |     |     |     | 60  |  |
| 55 | Ala | Asp | Ser | Val | Lys | Gly | Arg | Phe | Thr | Ile | Ser | Arg | Asp | Asn | Ser |  |
|    |     |     |     |     | 65  |     |     |     |     | 70  |     |     |     |     | 75  |  |

Lys Asn Thr Leu Tyr Leu Gln Met Asn Ser Leu Arg Ala Glu Asp  
80 85 90

Thr Ala Val Tyr Tyr Cys Ala Arg Gly Phe Asp Tyr Trp Gly Gln  
95 100 105

Gly Thr Leu Val Thr Val Ser Ser  
110 113

(2) INFORMATION FOR SEQ ID NO:7:

- (i) SEQUENCE CHARACTERISTICS:  
(A) LENGTH: 184 amino acids  
(B) TYPE: Amino Acid  
(D) TOPOLOGY: Linear

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:7:

Lys Gly Asn Val Asp Leu Val Phe Leu Phe Asp Gly Ser Met Ser  
1 5 10 15

Leu Gln Pro Asp Glu Phe Gln Lys Ile Leu Asp Phe Met Lys Asp  
20 25 30

Val Met Lys Lys Leu Ser Asn Thr Ser Tyr Gln Phe Ala Ala Val  
35 40 45

Gln Phe Ser Thr Ser Tyr Lys Thr Glu Phe Asp Phe Ser Asp Tyr  
50 55 60

Val Lys Arg Lys Asp Pro Asp Ala Leu Leu Lys His Val Lys His  
65 70 75

Met Leu Leu Leu Thr Asn Thr Phe Gly Ala Ile Asn Tyr Val Ala  
80 85 90

Thr Glu Val Phe Arg Glu Glu Leu Gly Ala Arg Pro Asp Ala Thr  
95 100 105

Lys Val Leu Ile Ile Ile Thr Asp Gly Glu Ala Thr Asp Ser Gly  
110 115 120

Asn Ile Asp Ala Ala Lys Asp Ile Ile Arg Tyr Ile Ile Gly Ile  
125 130 135

Gly Lys His Phe Gln Thr Lys Glu Ser Gln Glu Thr Leu His Lys  
140 145 150

Phe Ala Ser Lys Pro Ala Ser Glu Phe Val Lys Ile Leu Asp Thr  
155 160 165

Phe Glu Lys Leu Lys Asp Leu Phe Thr Glu Leu Gln Lys Lys Ile  
170 175 180

Tyr Val Ile Glu  
184

(2) INFORMATION FOR SEQ ID NO:8:

(i) SEQUENCE CHARACTERISTICS:  
 (A) LENGTH: 184 amino acids  
 (B) TYPE: Amino Acid  
 (D) TOPOLOGY: Linear

5 (xi) SEQUENCE DESCRIPTION: SEQ ID NO:8:

|    |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |  |
|----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|--|
|    | Lys | Gly | Asn | Val | Asp | Leu | Ile | Phe | Leu | Phe | Asp | Gly | Ser | Met | Ser |  |
|    | 1   |     |     |     | 5   |     |     |     |     | 10  |     |     |     |     | 15  |  |
| 10 | Leu | Gln | Pro | Asp | Glu | Phe | Gln | Lys | Ile | Leu | Asp | Phe | Met | Lys | Asp |  |
|    |     |     |     |     | 20  |     |     |     |     | 25  |     |     |     |     | 30  |  |
|    | Val | Met | Lys | Lys | Leu | Ser | Asn | Thr | Ser | Tyr | Gln | Phe | Ala | Ala | Val |  |
|    |     |     |     |     | 35  |     |     |     |     | 40  |     |     |     |     | 45  |  |
| 15 | Gln | Phe | Ser | Thr | Ser | Tyr | Lys | Thr | Glu | Phe | Asp | Phe | Ser | Asp | Tyr |  |
|    |     |     |     |     | 50  |     |     |     |     | 55  |     |     |     |     | 60  |  |
|    | Val | Lys | Gln | Lys | Asp | Pro | Asp | Ala | Leu | Leu | Glu | His | Val | Lys | His |  |
| 20 |     |     |     |     | 65  |     |     |     |     | 70  |     |     |     |     | 75  |  |
|    | Met | Leu | Leu | Leu | Thr | Asn | Thr | Phe | Gly | Ala | Ile | Asn | Tyr | Val | Ala |  |
|    |     |     |     |     | 80  |     |     |     |     | 85  |     |     |     |     | 90  |  |
| 25 | Thr | Glu | Val | Phe | Arg | Glu | Glu | Leu | Gly | Ala | Arg | Pro | Asp | Ala | Thr |  |
|    |     |     |     |     | 95  |     |     |     |     | 100 |     |     |     |     | 105 |  |
|    | Lys | Val | Leu | Ile | Ile | Ile | Thr | Asp | Gly | Glu | Ala | Thr | Asp | Ser | Gly |  |
|    |     |     |     |     | 110 |     |     |     |     | 115 |     |     |     |     | 120 |  |
| 30 | Asn | Ile | Asp | Ala | Ala | Lys | Asp | Ile | Ile | Arg | Tyr | Ile | Ile | Gly | Ile |  |
|    |     |     |     |     | 125 |     |     |     |     | 130 |     |     |     |     | 135 |  |
|    | Gly | Lys | His | Phe | Gln | Thr | Lys | Glu | Ser | Gln | Glu | Thr | Leu | His | Lys |  |
| 35 |     |     |     |     | 140 |     |     |     |     | 145 |     |     |     |     | 150 |  |
|    | Phe | Ala | Ser | Lys | Pro | Ala | Ser | Glu | Phe | Val | Lys | Ile | Leu | Asp | Thr |  |
|    |     |     |     |     | 155 |     |     |     |     | 160 |     |     |     |     | 165 |  |
| 40 | Phe | Glu | Lys | Leu | Lys | Asp | Leu | Phe | Thr | Glu | Leu | Gln | Lys | Lys | Ile |  |
|    |     |     |     |     | 170 |     |     |     |     | 175 |     |     |     |     | 180 |  |
|    | Tyr | Ala | Ile | Glu |     |     |     |     |     |     |     |     |     |     |     |  |
|    |     |     |     |     | 184 |     |     |     |     |     |     |     |     |     |     |  |

45

(2) INFORMATION FOR SEQ ID NO:9:

(i) SEQUENCE CHARACTERISTICS:  
 (A) LENGTH: 7 amino acids  
 (B) TYPE: Amino Acid  
 (D) TOPOLOGY: Linear

50

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:9:

|    |     |     |     |     |     |     |     |
|----|-----|-----|-----|-----|-----|-----|-----|
| 55 | Lys | His | Val | Lys | His | Met | Leu |
|    | 1   |     |     |     | 5   |     | 7   |

## (2) INFORMATION FOR SEQ ID NO:10:

- (i) SEQUENCE CHARACTERISTICS:  
(A) LENGTH: 11 amino acids  
(B) TYPE: Amino Acid  
(D) TOPOLOGY: Linear

## (xi) SEQUENCE DESCRIPTION: SEQ ID NO:10:

Pro Lys Asn Ser Ser Met Ile Ser Asn Thr Pro  
1 5 10 11

## (2) INFORMATION FOR SEQ ID NO:11:

- (i) SEQUENCE CHARACTERISTICS:  
(A) LENGTH: 7 amino acids  
(B) TYPE: Amino Acid  
(D) TOPOLOGY: Linear

## (xi) SEQUENCE DESCRIPTION: SEQ ID NO:11:

His Gln Ser Leu Gly Thr Gln  
1 5 7

## (2) INFORMATION FOR SEQ ID NO:12:

- (i) SEQUENCE CHARACTERISTICS:  
(A) LENGTH: 8 amino acids  
(B) TYPE: Amino Acid  
(D) TOPOLOGY: Linear

## (xi) SEQUENCE DESCRIPTION: SEQ ID NO:12:

His Gln Asn Leu Ser Asp Gly Lys  
1 5 8

## (2) INFORMATION FOR SEQ ID NO:13:

- (i) SEQUENCE CHARACTERISTICS:  
(A) LENGTH: 8 amino acids  
(B) TYPE: Amino Acid  
(D) TOPOLOGY: Linear

## (xi) SEQUENCE DESCRIPTION: SEQ ID NO:13:

His Gln Asn Ile Ser Asp Gly Lys  
1 5 8

## (2) INFORMATION FOR SEQ ID NO:14:

- (i) SEQUENCE CHARACTERISTICS:  
(A) LENGTH: 8 amino acids  
(B) TYPE: Amino Acid  
(D) TOPOLOGY: Linear

## (xi) SEQUENCE DESCRIPTION: SEQ ID NO:14:

Val Ile Ser Ser His Leu Gly Gln  
1 5 8

## (2) INFORMATION FOR SEQ ID NO:15:

## (i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 26 base pairs
- (B) TYPE: Nucleic Acid
- (C) STRANDEDNESS: Single
- (D) TOPOLOGY: Linear

## (xi) SEQUENCE DESCRIPTION: SEQ ID NO:15:

CACTTTGGAT ACCGCGTCCT GCAGGT 26

## (2) INFORMATION FOR SEQ ID NO:16:

## (i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 26 base pairs
- (B) TYPE: Nucleic Acid
- (C) STRANDEDNESS: Single
- (D) TOPOLOGY: Linear

## (iv) antisense

## (xi) SEQUENCE DESCRIPTION: SEQ ID NO:16:

CATCCTGCAG GTCTGCCTTC AGGTCA 26

## (2) INFORMATION FOR SEQ ID NO:17:

## (i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 121 amino acids
- (B) TYPE: Amino Acid
- (D) TOPOLOGY: Linear

## (xi) SEQUENCE DESCRIPTION: SEQ ID NO:17:

Glu Val Gln Leu Val Glu Ser Gly Gly Gly Leu Val Gln Pro Gly  
1 5 10 15

Gly Ser Leu Arg Leu Ser Cys Ala Ala Ser Gly Tyr Ser Phe Thr  
20 25 30

Gly His Trp Met Asn Trp Val Arg Gln Ala Pro Gly Lys Gly Leu  
35 40 45

Glu Trp Val Gly Met Ile Ala Pro Ala Ser Ser Ser Thr Arg Tyr  
50 55 60

Asn Gln Lys Phe Lys Asp Arg Phe Thr Ile Ser Val Asp Lys Ser  
65 70 75

Lys Asn Thr Leu Tyr Leu Gln Met Asn Ser Leu Arg Ala Glu Asp  
80 85 90

Thr Ala Val Tyr Tyr Cys Ala Arg Gly Ile Tyr Phe Tyr Gly Thr  
95 100 105



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|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Thr | Tyr | Phe | Asp | Tyr | Trp | Gly | Gln | Gly | Thr | Leu | Val | Thr | Val | Ser |
|     |     |     |     | 110 |     |     |     |     | 115 |     |     |     |     | 120 |

|     |
|-----|
| Ser |
| 121 |

5